

REMARKS

Several claims are revised to place those claims in accordance with US claiming practice and to remove possibly-indefinite wording. In particular, the "preferably..." limitations are removed from Claims 1, 3, and 5, and those limitations are restored as positive recitations in new Claims 8, 9, and 10. Claim 1 also is revised by substituting the indefinite article --an-- for "~~the~~ edge region", which formerly lacked proper antecedent basis in that claim." For the same reason, Claim 7 is revised to recite --a forward direction of the FFC--. In Claims 3 and 5, "it" is replaced by wording clarifying the reference of that adjective. Claims 3 and 5 are revised to clarify the functional interrelation between recited elements. These revisions are made only to clarify the meaning of the original claims and are not intended to enlarge or diminish their scope.

Claims 1-10 remain, with no claim previously allowed.

The examiner's objection to Claim 1 is noted. In response, the applicant has amended the final two lines of that claim to reposition "in a subsequent step" following "is moved". This revision to Claim 1 is submitted in response to the objection but is not believed to enlarge or diminish the scope of that claim.

Claims 1 and 2 stand rejected as anticipated by *Usui* (US 4,931,616). The applicant respectfully traverses this rejection.

The applicant has invented a novel method for stripping insulation from a flat flexible cable (FFC) to produce a window region exposing the surface of a conductive lead in the FFC. This novel method comprises operating a laser along only the border or edge region of the insulation window, and thus not along the interior of that window. The insulating material in the interior region of the thus-defined window is then

physically removed. Because the laser need only operate along the edge region defining the insulation window, instead of the entire surface of that window as in the prior art, the processing time required according to the present method is reduced. Please see page 4, lines 4-8; and see page 3, lines 5-21 for other advantages provided by the present invention.

Usui does not disclose using a laser to form a window in insulation of an FFC by operating only in an edge region of the window. Accordingly, *Usui* cannot anticipate Claims 1 et al.

Instead of defining a window by operating only on an edge region of the window, *Usui* exposes the entire area of the desired window to the laser beam. Please see column 5, lines 5-12, wherein *Usui* states that "... an area of the coating of the flat cable 1 which is to be removed is defined precisely by an edge of the window 15a of the clamper 15, when irradiated with the laser beam 72. Therefore, with the size and shape of the window 15a coinciding with that of the area of the flat cable 1, it is possible to remove the coating of the portion of the flat cable 1 precisely." (emphasis added)

Column 6, lines 1-7 of *Usui* further emphasizes that the size and shape of the clamper window 15a defines the insulation area to be removed by the laser beam. Lenses 10 and 11 form a laser beam having a rectangular cross-section (column 4, lines 56-59) so that the beam "has a contour... corresponding to a selected region of the flat cable" (column 4, lines 64-66). In other words, *Usui* teaches forming a window in an FFC by *exposing the entire window area* to the laser beam.

That teaching by *Usui* is the opposite of the invention disclosed and claimed by the applicant, characterized by operating the laser only on an edge region of the window.

In a subsequent step, the insulation remaining in the interior of that edge region of the window is removed. *Usui* simply fails to anticipate the step of forming the window by operating a laser on only an edge region of the window. Accordingly, that reference fails to anticipate Claim 1 and any claim depending thereon.

Dependent Claim 2 states that the remaining insulation in the interior of the window is removed by means of mechanical, thermal, or some other physical method. *Usui* likewise fails to anticipate that aspect of the present invention. Because *Usui* uses a laser beam to remove insulation from the entire area of a window, that reference fails to disclose any subsequent step of a physical method for removing the "remaining insulation in the interior of the window" and, indeed, according to *Usui* no such insulation would remain. For this additional reason, *Usui* fails to anticipate the method of Claim 2.

Concerning the alleged teaching in *Usui* for using a mechanical stripper, the only mention appears at column 1, lines 50-54. There, *Usui* states "... for the flat cable as mentioned above whose conductors are very thin, it is almost impossible to use a mechanical stripper for insulating coating removal..." (emphasis added) *Usui* then discloses using a laser beam to remove the insulation from the entire window, thereby leaving no insulation remaining for the difficult (according to *Usui*) removal by using a mechanical stripper. The applicant submits that while *Usui* may "disclose" the use of a mechanical stripper, that disclosure would have directed one of ordinary skill away from using mechanical means for removing insulation from a flat flexible cable.

Claims 3 and 4 are rejected as unpatentable over *Usui* in view of *Hoffa* (US 5,630,341) and *Morino* (US 4,818,322). This rejection asserts *Usui* as stated in the anticipation rejection and also asserts that *Usui* teaches about mechanical stripping.

Hoffa and *Morino* are cited as disclosing a method of using cutting blades and removing an insulative wire coating, and the use of a roller in laser processing of wire scribed interconnections. The rejection then concludes that it would have been obvious to use a cutting/removable as in *Hoffa* in the *Usui* processing, and also to use a roller as taught in *Morino*.

The applicant respectfully traverses that rejection of Claims 3 and 4.

As pointed out above, *Usui* has no teaching whatsoever of an insulation-stripping method using a laser to operate on only an edge region of the window. Instead, *Usui* uses a laser beam to remove insulation from the *entire* window. The rejection is thus inappropriate for at least two reasons: *First*, because *Usui* does not teach one of ordinary skill to operate only on an edge region of the window with a laser; and *second*, as *Usui* removes insulation from the *entire window* with a laser beam, no insulation remains for removable by any mechanical device. Because *Usui* teaches removing the entire window area with a laser beam, one of ordinary skill would have no reason to add the teachings of *Hoffa* or *Morino* to remove a nonexistent piece of insulation. Accordingly, the rejection of Claims 3 and 4 as unpatentable over *Usui* in view of *Hoffa* and *Morino* should be withdrawn.

Furthermore, it is not possible with the cutting blades of *Hoffa* to remove insulation from the interior of the window. Those blades are only usable to make a cut perpendicular to the length of a single wire, not to pull away or lift the insulation from a curve of a FFC.

Morino merely discloses rollers for moving a cable. That reference does not disclose a roller used for mechanical removal of insulation and has nothing to do with the present invention.

Claims 5-7 are rejected as unpatentable over *Usui* in view of *Seifert* (US 3,694,843) and *Morino*. *Seifert* is cited as disclosing the use of brushes to remove insulation off wires, and *Morino* is again cited as disclosing the use of rollers in laser processing of wire scribed interconnections. The applicant respectfully traverses this rejection.

Usui fails to teach or suggest the step of using a laser to form only an edge region of a window on an FFC. No other reference of record supplies that teaching missing in *Usui*. For that reason alone, the rejection of Claims 5-7 should be withdrawn.

Further, and as mentioned above, one of ordinary skill in the art would see no reason to add brushes or rollers for removing insulation, because *Usui* leaves no insulation remaining for removal by physical means. In *Usui*, the laser beam removes insulation from the entire area of the window, as defined by the window 15a of the clamper apparatus. Accordingly, the person of ordinary skill would have no need of a subsequent processing step involving physical means for removing insulation remaining in the interior of the window, because no such insulation remains according to *Usui*. Moreover, *Seifert* does not teach using a brush to bite into the edge region of a window exposed by a laser. For those reasons, the rejection of Claims 5-7 should be withdrawn.


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The foregoing is submitted as a complete response to the Office action identified above. The Applicant submits that all claims in this application are in condition for allowance and solicits a notice to that effect.

Respectfully submitted,

MERCHANT & GOULD

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Roger T. Frost
Reg. No. 22,176

Merchant & Gould, LLC
P.O. Box 2903
Minneapolis, MN 55402-0903
Telephone: 404.954.5100

